

Conceptual Biology

Chapter 6: Inheritance

Comparing Mitosis and Meiosis

1. Give some examples of when organisms use mitosis.

2. a. When do organisms use meiosis?

- b. What kinds of cells are produced through meiosis?

Circle the correct answers:

3. a. In meiosis, the number of cells produced is [one] [two] [three] [four].

In mitosis, the number of cells produced is [one] [two] [three] [four].

- b. During meiosis, cells produced are [haploid] [diploid].

During mitosis, cells produced are [haploid] [diploid].

- c. The cells produced are [different from one another] [identical] in meiosis.

The cells produced are [different from one another] [identical] in mitosis.

- d. Crossing over happens during [mitosis] [meiosis].

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Dominant and Recessive Traits

1. Some small woodland creatures have either spots or stripes. Fur pattern is determined by a single gene. The striped phenotype is **dominant** and the spotted phenotype is **recessive**.

Both the woodland creatures shown below are **homozygotes**.



Genotype is [aa] [AA] [aa] [AA].

Phenotype is [spotted] [striped] [spotted] [striped].

2. The woodland creature below is a **heterozygote**. Does it have spots or stripes?
Sketch the woodland creature's fur pattern and circle the genotype and phenotype.



Genotype is [aa] [AA] [Aa].

Phenotype is [spotted] [striped].

Fill in the blanks:

3. Here are two more woodland creatures. Which of the following must be a **homozygote**?
Which could be either a **homozygote** or a **heterozygote**?



So we see that the spotted one must be a [homozygote] [heterozygote],

since you have to have two recessive alleles to have spots. The striped one is

[a homozygote] [a heterozygote] [either a homozygote or heterozygote].

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Inheritance Patterns

1. Suppose you breed two woodland creatures together. One individual has genotype aa, and the other has genotype AA. Draw the cross below:



Genotype is

[aa] [AA]

[aa] [AA].

Phenotype is

[spotted] [striped]

[spotted] [striped].

2. What are the progeny like?



Genotype is

[aa] [AA] [Aa] and phenotype is [spotted] [striped].

Fill in the table below:

3. Now you breed two of the progeny from Question 2 together. What will their offspring look like?

		Allele received from father	
		A	a
Allele received from mother	A	 Genotype: Phenotype:	 Genotype: Phenotype:
	a	 Genotype: Phenotype:	 Genotype: Phenotype:

So, the offspring include woodland creatures that are

[spotted] [striped] [both spotted and striped].

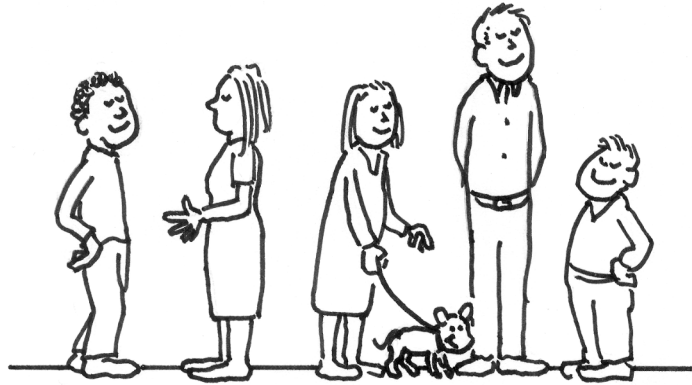
The offspring are found in a ratio of _____ striped: _____ spotted.

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Variable Traits, Heritable Traits

1. Of the human traits listed below, put a **V** for variable traits and put an **H** for heritable traits.
(Note: Some traits are both variable and heritable.)



- a. age _____
- b. eye color _____
- c. number of toes _____
- d. curliness or straightness of hair _____
- e. presence or absence of dimples _____
- f. upright posture _____
- g. owning versus not owning a dog _____
- h. height _____

2. Which traits above have the potential of evolving via natural selection?
